

**Claims**

1. A substantially on-axis stereoscopic system comprising: a concave mirror; a single focusing element  
5 for focusing both of a first image and a second image towards the concave mirror, and a beam splitter between the mirror and the focusing element for directing light from the focusing element substantially along the optical axis of the mirror whilst allowing light reflected from  
10 the mirror to be transmitted therethrough.
2. A system as claimed in claim 1, wherein the focusing element is adapted to focus the first and second images in a viewing plane that is on or in front of or behind  
15 the concave mirror.
3. A system as claimed in claim 1 or claim 2 wherein a plurality of focusing elements is provided on a common optical axis, each focusing element being in the optical  
20 path of both the first and second projected images.
4. A system as claimed in any of the preceding claims wherein the one or more focusing elements each comprise a lens.  
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5. A system as claimed in any of the preceding claims wherein the focusing element is located at the radius of curvature of the concave mirror.
- 30 6. A system as claimed in any of the preceding claims further comprising a pair of planar mirrors positioned so as to bisect the focusing element, one of the planar mirrors being position to direct the first image toward

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the focusing element and the other being position to direct the second image toward the focusing element.

7. A system as claimed in any of the preceding claims,  
5 wherein one or more reflectors are provided for directing the first and second images onto the focusing element.

8. A system as claimed in any of the preceding claims  
10 further comprising a tracking system for tracking movement of a viewer, and a drive for causing movement of only the concave mirror in response to movement detected by the tracking system.

9. A stereoscopic system comprising: a concave mirror;  
15 first and second focusing means for focusing first and second images towards the screen, the first image being positioned so that its centre is offset from the optical axis of the first focusing means and the second image being positioned so that its centre is offset from the  
20 optical axis of the second focusing means, and a beam splitter between the mirror and the first and second focusing means for directing light from the first and second focusing means towards the mirror whilst allowing light reflected from the mirror to be transmitted  
25 therethrough.

10. A system as claimed in claim 9, wherein the first and second focusing means are adapted to focus the first and second images in a viewing plane that is on or in front  
30 of or behind the concave mirror.

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11. A system as claimed in claim 9 or claim 10, wherein one or more reflectors are provided for directing the first and second images onto the focusing means.
- 5 12. A system as claimed in any one of claims 9 to 11 wherein a beam splitter is located on a beam path between the first and second focusing means and the concave mirror.
- 10 13. A system as claimed in any one of claims 9 to 12 further comprising a tracking system for tracking movement of a viewer, and a drive for causing movement of the optical element in response to movement detected by the tracking system.
- 15 14. A stereoscopic system comprising a movable optical element, preferably a concave mirror, that acts as a directional screen; a projection system for projecting first and second images onto the optical element, the first and second images being provided from first and second image sources; a tracking system for tracking movement of a viewer, and a drive for causing movement of the optical element in response to movement detected by the tracking system.
- 20 15. A stereoscopic system as claimed in claim 14 wherein the projection system includes a single focusing element for focusing both of a first image and a second image towards the concave mirror, and a beam splitter between the mirror and the focusing element for directing light from the focusing element substantially along the optical axis of the mirror whilst allowing light reflected from the mirror to be transmitted therethrough.
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16. A stereoscopic system as claimed in claim 14 wherein the projection system includes first and second focusing means for focusing first and second images towards the screen, the first image being positioned so that its centre is offset from the optical axis of the first focusing means and the second image being positioned so that its centre is offset from the optical axis of the second focusing means, and a beam splitter between the mirror and the first and second focusing means for directing light from the first and second focusing means towards the mirror whilst allowing light reflected from the mirror to be transmitted therethrough.

17. A stereoscopic display comprising a concave mirror that acts as a directional screen, a projection system including a plurality of reflecting surfaces for directing first and second images onto focusing means, and a beam splitter between the mirror and the focusing means for directing light from the focusing means towards the mirror whilst allowing light reflected from the mirror to be transmitted therethrough.

18. A display as claimed in claim 17, wherein the focusing means have an optical axis that is substantially aligned with the optical axis of the concave mirror, so that the display is substantially on-axis.

19. A stereoscopic system as claimed in claim 18 wherein the focusing means includes a single focusing element for focusing both of a first image and a second image towards the concave mirror.

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20. A stereoscopic system as claimed in claim 17 wherein the focusing means includes first and second focusing means for focusing first and second images towards the screen, the first image being positioned so that its  
5 centre is offset from the optical axis of the first focusing means and the second image being positioned so that its centre is offset from the optical axis of the second focusing means.